

Introduction to Neuroradiology

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EXHIBIT

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Direct vertebral puncture has not received wide acceptance in this country. This technique is best performed using a spinal needle (Sheldon) with a side hole but no end hole (422). In most centers vertebral arteriography is performed today via selective catheterization (397).

Brachial Arteriography

Retrograde flush brachial arteriography was introduced by Gould et al in 1955 (177). On the right side, both carotid and vertebral circulations may be opacified. On the left, only the vertebral system is visualized in adults, although in young children all four vessels may be well opacified by injection of either brachial artery. The disadvantage of this technique lies in the variability of the intracranial filling; in general, the diagnostic quality of these examinations is poorer than with antegrade methods. This is also true of axillary and subclavian retrograde flush techniques. Bilateral simultaneous retrograde brachial angiography has been reported to show considerably better visualization of the vertebral and basilar arteries without increase in morbidity (20).

Selective Catheterization

Selective catheterization of any or all of the brachiocephalic vessels has recently come into prominence. Typically, specially shaped catheters (Fig 2-69) are introduced percutaneously into the femoral artery and positioned under fluoroscopic control with the catheter tip in the desired vessel (4). In experienced hands this technique carries a low morbidity (5), and the resultant radiographic examinations are of highest quality.

Arch Aortography

Arch aortography yields good visualization of the brachiocephalic vessels at their origins and in the neck (164) (Fig 2-70). However, opacification of intracranial vessels is usually not of diagnostic quality. The technique has its greatest application in the evaluation of patients with extracranial occlusive vascular disease; in such cases, however, supplementation with appropriate selective or direct puncture studies for evaluation of the intracranial circulation is usually necessary.

Morbidity

Angiography of the vessels of the head and neck carries a certain morbidity. The incidence

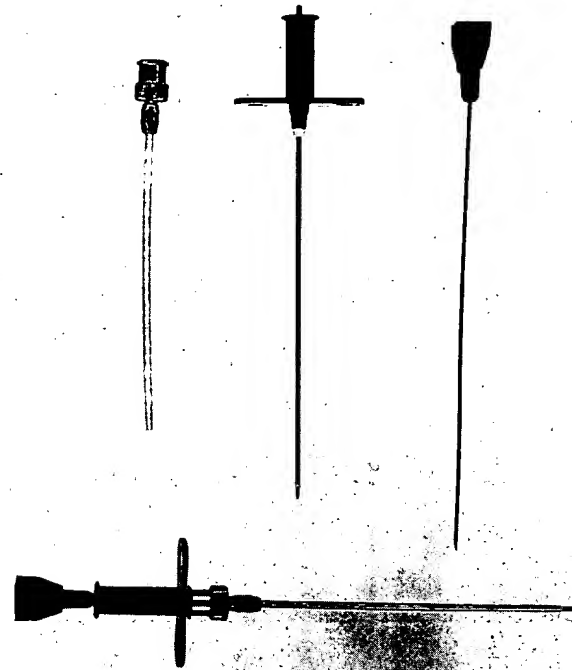


Fig 2-68. Teflon sheath-needle (Amplatz). A completely assembled sheath-needle combination (bottom) consists of a beveled metal stylet (top, right), a hollow metal cannula with plastic hub (top, middle), and a blunt-tipped Teflon sheath with metal hub (top, left). After the artery is punctured, the stylet is withdrawn. The cannula-sheath combination is then gradually and slowly pulled back until free pulsatile flow is obtained. The Teflon sheath is then slowly advanced downward over the cannula while backflow through the cannula is continuously monitored. When the sheath is securely in place, the metal cannula is withdrawn.

of irreversible neurologic deficit following cerebral angiography is certainly less than 1 percent in competent hands using modern techniques and presently available contrast media (5). Situations carrying an above-average risk occur in patients with occlusive vascular disease in whom, for example, direct carotid puncture may be performed in an area of preexisting stenosis and result in further compromise of the lumen (69), or catheterization of the vertebral artery may reduce flow in a vessel which normally has a relatively low flow rate (212).

Extraluminal injection into the arterial wall can usually be readily recognized by the failure of the contrast medium to advance distally; it remains